WEST Search History

DATE: Sunday, June 22, 2003

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ		
L41	L40 and (heparin or antibiotic or dye)	21	L41
L40	L39 and (medical device or catherter)	29	L40
L39	L38 same l33	57	L39
L38	l32 same l6	340	L38
L37	l32 same dendrimer	10	L37
L36	l32 and dendrimer	82	L36
L35	L34 same (medical device or catherter)	26	L35
L34	L33 same l32	6479	L34
L33	polyurethane	265577	L33
L32	coating composition	89642	L32
L31	(medical device or catheter) same l5 same dendrimer	1	L31
L30	l1 and l3 and catheter and medical device	1	L30
L29	l1 and catheter	1	L29
L28	l1 and medical device	1	L28
L27	L26 and l25	8	L27
L26	l24 and l4	15	L26
L25	l24 and l6	9	L25
L24	L22 and l8	35	L24
L23	L22 and l10	35	L23
L22	l18 and l5	117	L22
L21	L19 and l4	19	L21
L20	L19 and l6	13	L20
L19	L18 and l10	46	L19
L18	L17 and l3	160	L18
L17	catheter	74326	L17
L16	l15 and l14	10	L16
L15	l13 and l11	10	L15
L14	l11 and l12	10	L14
L13	L12 and l8	578	L13
L12	l4 and l5 and l6	5069	L12
L11	l8 and l3	138	L11
L10	heparin	27947	L10
L9	heparin o	19	L9
L8	heparin or (sodium adj heparin)	27947	L8
L7	heparin or sodium adj heparin	27947	L7

L6	pvp! or polyvinylpyrrolidone	51690	L6
L5	coat$3	1660749	L5
L4	polyurethane	265577	L4
L3	dendrimer	2241	L3
L2	tomalia.inv.	169	L2
L1	Tomalia.inv.	169	L1

END OF SEARCH HISTORY

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Search Results -

Term	Documents
(2 AND 6).USPT,PGPB,JPAB,EPAB,DWPI.	43
(L6 AND L2).USPT,PGPB,JPAB,EPAB,DWPI.	43

Database: US Patents Full-Text Database; US Pre-Grant Publication Full-Text Database; JPO Abstracts Database; EPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L7

Refine Search

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Search History

DATE: Sunday, June 22, 2003 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ			
L7	L6 and l2	43	L7
L6	l4 and l3 and l5	5069	L6
L5	pvp! or polyvinylpyrrolidone	51690	L5
L4	coat$3	1660749	L4
L3	polyurethane	265577	L3
L2	dendrimer	2241	L2
L1	tomalia.inv.	169	L1

END OF SEARCH HISTORY

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L15 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2003 ACS

AB Dendrimers such as Si(CH2CH2SiMe2Cl)4, Si[CH2CH2Si(CH2CH2SiMe2Cl)3]4, and PhSi(CH2CH2SiMe2Cl)3 are prepd. by hydrosilylation [e.g., of HSiMe2Cl with tetravinylsilane or tetrakis[2-(trivinylsilyl)ethyl]silane] and hydrolyzed to replace the Cl groups with OH groups, giving hydroxysilyl group-contg. dendrimers [e.g., Si(CH2CH2SiMe2OH)4] suitable for the prepn. of coating materials [e.g., by reaction with a metal alkoxide such as (EtO)4Si] which give flexible coatings with good heat, chem., and scratch resistance.

ACCESSION NUMBER: 1997:12520 CAPLUS
DOCUMENT NUMBER: 126:48431
TITLE: Hydroxysilyl-containing carbosilane dendrimers, their reaction products with metal alkoxides, and coatings prepared from them
INVENTOR(S): Mager, Michael; Jentsch, Joerg-Dietrich; Schild, Christoph
PATENT ASSIGNEE(S): Bayer A.-G., Germany
SOURCE: Eur. Pat. Appl., 22 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 743313	A2	19961120	EP 1996-106954	19960503
EP 743313	A3	19971015		
EP 743313	B1	20020320		
R: CH, DE, FR, GB, IT, LI, NL				
DE 19603242	A1	19961121	DE 1996-19603242	19960130
US 5677410	A	19971014	US 1996-641847	19960502
JP 08311205	A2	19961126	JP 1996-141110	19960513

PRIORITY APPLN. INFO.: DE 1995-19517839 A 19950516
DE 1996-19603242 A 19960130
OTHER SOURCE(S): MARPAT 126:48431

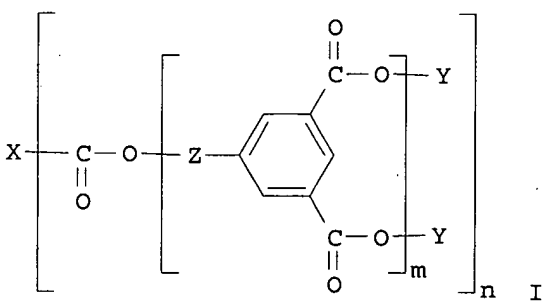
L15 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2003 ACS

AB Hyperbranched polycondensates derived from ABx-type monomers were generally recognized as the cheaper and economically more feasible counterparts of the well-known other members of the dendritic macromol. family, the perfectly branched dendrimers. Since they can be manufd. more quickly and easily in a one-step polymn. procedure, their significantly lower cost price puts them in a much more favorable position to be industrially applied as coating resins. The conceptual design of a branched macromol. is ideally outlined for film forming applications. The viscosity in relation to their mol. wt. is kept low due to their compact morphol. hampering chain entanglements, while on the other hand, the large no. of functional end groups enable efficient crosslinking. Standing apart from the std. ABx approaches, optionally employing a Bx starter mol., DSM has now developed a new type of hyperbranched polyester-amides derived from cyclic carboxylic anhydrides and dialkanolamines. In a one-pot procedure, the dialkanolamine mols. react preferentially via the secondary amine group with the cyclic anhydride, forming in situ a bis(hydroxyalkyl)amide group (AB2) contg. carboxylic acid. Because of the known high reactivity of 2-hydroxyalkylamide groups towards esterification with carboxylic acids, a fast and efficient polycondensation at temps. of 140-200.degree. without the addn. of a catalyst can be performed. Using the dialkanolamine component in molar excess over the anhydride, gel formation is excluded and a predictable and stable melt viscosity is obtained. The resulting hydroxyl functional resins were applied successfully as powder coatings binder components. In addn., the presence of the reactive hydroxyl groups makes these hyperbranched polymers very suitable materials for further modifications. By letting them react with aliph. and/or arom. monoacids, for example, polymers with different properties could be synthesized which were found very suitable for a no. of coating applications, for example, air drying topcoats and primers and two-pack urethane lacquers. A combination of favorable properties, including high hardness and early drying, high solids content, and weatherability was obsd.

ACCESSION NUMBER: 2000:870771 CAPLUS
DOCUMENT NUMBER: 134:238901
TITLE: Novel hyperbranched resins for coating applications
AUTHOR(S): van Benthem, R. A. T. M.
CORPORATE SOURCE: DSM Research, Geleen, 6160 MD, Neth.
SOURCE: Progress in Organic Coatings (2000), 40(1-4), 203-214
CODEN: POGCAT; ISSN: 0300-9440
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal
LANGUAGE: English
REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2003 ACS

GI



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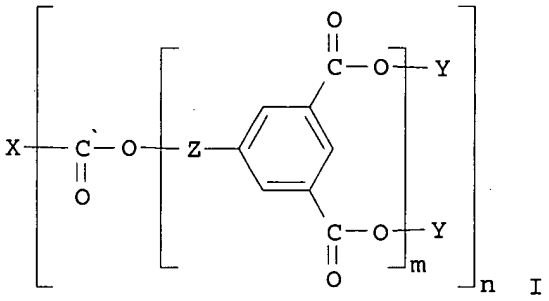

I

AB A curable coating compn. with low viscosity, high curability, good heat- and wet-resistance comprises an arom. ester (meth)acrylate dendrimer which is composed of a central unit derived from an arom. compd. having carboxyl groups and branching units each derived from an arom. compd. having one hydroxyl group and two carboxyl groups and is represented by general formula (I) (X: C6-20 aryl group; Y: C6-20 org. group contg. (meth)acrylic group; Z: direct bond or C6-20 aryl group; m = 1-10; n = 3-6), and a polymn. initiator. Thus, a coating compn. comprising above arom. ester acrylate dendrimer prepd. 50 g, dipentaerythritol hexaacrylate 30 g, tetrahydrofurfuryl acrylate 20 g, and Irgacure 1700 5 g was coated on plated steel and polycarbonate plates, showing soln. viscosity 11,000 cps at 25.degree., good adhesion and hardness.

ACCESSION NUMBER: 1999:136871 CAPLUS
DOCUMENT NUMBER: 130:183861
TITLE: Aromatic ester (meth)acrylate dendrimer and its curable resin coating composition
INVENTOR(S): Yuasa, Masatoshi; Kawasato, Hironobu; Teramoto, Takero
PATENT ASSIGNEE(S): Nippon Steel Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 32 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9908993	A1	19990225	WO 1998-JP3648	19980817
W: KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 11060540	A2	19990302	JP 1997-221491	19970818
EP 1006101	A1	20000607	EP 1998-937843	19980817
R: DE, FR, GB, NL				
US 6255444	B1	20010703	US 2000-485849	20000217

PRIORITY APPLN. INFO.: JP 1997-221491 A 19970818
WO 1998-JP3648 W 19980817
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L15 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2003 ACS

AB A review on dendrimer porphyrins, an azo dendrimer, a **dendrimer coating** on a rodlike mol. wire, a water-sol. dendrimer complex with Zn porphyrin, and a light-collecting dendrimer.

ACCESSION NUMBER:	2001:807111 CAPLUS
DOCUMENT NUMBER:	136:263643
TITLE:	Photo-functional dendrimers
AUTHOR(S):	Aida, Takuzo; Jiang, Dong-Lin
CORPORATE SOURCE:	Graduate School of Engineering, University of Tokyo, Japan
SOURCE:	Mirai Zairyo (2001), 1(10), 38-45 CODEN: MZIABA
PUBLISHER:	Enu-Ti-Esu
DOCUMENT TYPE:	Journal; General Review
LANGUAGE:	Japanese

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L15 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2003 ACS
AN 2001:807111 CAPLUS
DN 136:263643
TI Photo-functional dendrimers
AU Aida, Takuzo; Jiang, Dong-Lin
CS Graduate School of Engineering, University of Tokyo, Japan
SO Mirai Zairyo (2001), 1(10), 38-45
CODEN: MZIABA
PB Enu-Ti-Esu
DT Journal; General Review
LA Japanese
CC 36-0 (Physical Properties of Synthetic High Polymers)
AB A review on dendrimer porphyrins, an azo dendrimer, a **dendrimer coating** on a rodlike mol. wire, a water-sol. dendrimer complex with Zn porphyrin, and a light-collecting dendrimer.
ST review photo functional dendrimer
IT Light-sensitive materials
(photo-functional dendrimer porphyrins)
IT Dendritic polymers
Porphyrins
RL: PRP (Properties)
(photo-functional dendrimer porphyrins)

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L15 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2003 ACS
AN 2001:807111 CAPLUS
DN 136:263643
TI Photo-functional dendrimers
AU Aida, Takuzo; Jiang, Dong-Lin
CS Graduate School of Engineering, University of Tokyo, Japan
SO Mirai Zairyo (2001), 1(10), 38-45
CODEN: MZIABA
PB Enu-Ti-Esu
DT Journal; General Review
LA Japanese
CC 36-0 (Physical Properties of Synthetic High Polymers)
AB A review on dendrimer porphyrins, an azo dendrimer, a **dendrimer coating** on a rodlike mol. wire, a water-sol. dendrimer complex with Zn porphyrin, and a light-collecting dendrimer.
ST review photo functional dendrimer
IT Light-sensitive materials
(photo-functional dendrimer porphyrins)
IT Dendritic polymers
Porphyrins
RL: PRP (Properties)
(photo-functional dendrimer porphyrins)

10051818blessing

L15 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2003 ACS
AN 2000:870771 CAPLUS
DN 134:238901
TI Novel hyperbranched resins for coating applications
AU van Benthem, R. A. T. M.
CS DSM Research, Geleen, 6160 MD, Neth.
SO Progress in Organic Coatings (2000), 40(1-4), 203-214
CODEN: POGCAT; ISSN: 0300-9440
PB Elsevier Science S.A.
DT Journal
LA English
CC 42-4 (Coatings, Inks, and Related Products)
AB Hyperbranched polycondensates derived from ABx-type monomers were generally recognized as the cheaper and economically more feasible counterparts of the well-known other members of the dendritic macromol. family, the perfectly branched dendrimers. Since they can be manufd. more quickly and easily in a one-step polymn. procedure, their significantly lower cost price puts them in a much more favorable position to be industrially applied as coating resins. The conceptual design of a branched macromol. is ideally outlined for film forming applications. The viscosity in relation to their mol. wt. is kept low due to their compact morphol. hampering chain entanglements, while on the other hand, the large no. of functional end groups enable efficient crosslinking. Standing apart from the std. ABx approaches, optionally employing a Bx starter mol., DSM has now developed a new type of hyperbranched polyester-amides derived from cyclic carboxylic anhydrides and dialkanolamines. In a one-pot procedure, the dialkanolamine mols. react preferentially via the secondary amine group with the cyclic anhydride, forming in situ a bis(hydroxyalkyl)amide group (AB2) contg. carboxylic acid. Because of the known high reactivity of 2-hydroxyalkylamide groups towards esterification with carboxylic acids, a fast and efficient polycondensation at temps. of 140-200.degree. without the addn. of a catalyst can be performed. Using the dialkanolamine component in molar excess over the anhydride, gel formation is excluded and a predictable and stable melt viscosity is obtained. The resulting hydroxyl functional resins were applied successfully as powder coatings binder components. In addn., the presence of the reactive hydroxyl groups makes these hyperbranched polymers very suitable materials for further modifications. By letting them react with aliph. and/or arom. monoacids, for example, polymers with different properties could be synthesized which were found very suitable for a no. of coating applications, for example, air drying topcoats and primers and two-pack urethane lacquers. A combination of favorable properties, including high hardness and early drying, high solids content, and weatherability was obsd.
ST polyamide polyester **dendrimer coating** property; hyperbranched polyamide polyester powder coating property
IT Alkyd resins
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(Uralac AD 44W70, Uralac AD 56W50, Uralac AM 181W50, Uralac AY 700, Uralac CY 499, Uralac XP 3782W80; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)
IT Polyesters, properties
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyamide-, dendrimers; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)
IT Dendritic polymers
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyamide-polyesters; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)
IT Polyamides, properties

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyester-, dendrimers; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

IT Coating materials
(powder; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

IT Adhesion, physical
Hardness (mechanical)
Impact strength
Luster
Melt viscosity
(synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

IT Polyurethanes, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings from)

IT 222973-01-5P, Adipic acid-diisopropanolamine-neopentyl glycol-phthalic anhydride-terephthalic acid-trimellitic anhydride copolymer
330478-55-2P, Adipic acid-1,2-cis-cyclohexanedicaraboxylic anhydride-diisopropanolamine-neopentyl glycol-terephthalic acid-trimellitic anhydride copolymer
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coating; synthesis and properties of thermosetting coatings crosslinked with hyperbranched hydroxypropylamide-contg. polyester-amides)

IT 222739-10-8P, Diisopropanolamine-phthalic anhydride copolymer
272785-18-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(hyperbranched, oligomeric, crosslinker; prepn. of hyperbranched hydroxypropylamide-contg. polyester-amides as crosslinkers for thermosetting coatings)

IT 222739-10-8D, Diisopropanolamine-phthalic anhydride copolymer, ester with tall oil fatty acids
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(hyperbranched; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

IT 330547-56-3P, Diisopropanolamine-phthalic anhydride copolymer neodecanoate hydrogen succinate ester
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(hyperbranched; synthesis and properties of thermosetting coatings crosslinked with hyperbranched hydroxypropylamide-contg. polyester-amides)

IT 272785-18-9D, ester with tall oil fatty acids
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(optionally cyclohexyl isocyanate-blocked,; synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

IT 330547-57-4, Diisopropanolamine-phthalic anhydride copolymer neodecanoate hydrogen succinate-Desmodur L copolymer 330547-58-5, cis-1,2-Cyclohexanedicarboxylic acid anhydride-diisopropanolamine-e copolymer benzoate hydrogen succinate-Tolonate HDT copolymer
330547-59-6, Diisopropanolamine-2-octenylsuccinic anhydride-phthalic anhydride copolymer benzoate hydrogen succinate-trimethylolpropane tris(tolylene diisocyanate) copolymer 330547-60-9, Diisopropanolamine-phthalic anhydride copolymer neodecanoate hydrogen succinate-trimethylolpropane tris(TDI) copolymer 330547-61-0, cis-1,2-

Cyclohexanedicarboxylic anhydride-diisopropanolamine-e copolymer benzoate hydrogen succinate-tris(hexamethylene triisocyanate) copolymer 330547-62-1, Diisopropanolamine-2-octenylsuccinic anhydride-phthalic anhydride copolymer benzoate hydrogen succinate-Desmodur L copolymer
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(prepn. and properties of thermosetting coatings crosslinked with hyperbranched hydroxypropylamide-contg. polyester-amides)

IT 330547-54-1, Diisopropanolamine-2-octenylsuccinic anhydride-phthalic anhydride copolymer benzoate hydrogen succinate ester 330547-55-2, cis-1,2-Cyclohexanedicarboxylic acid anhydride-diisopropanolamine copolymer benzoate hydrogen succinate ester
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(synthesis and properties of hyperbranched hydroxypropylamide-contg. polyester-amides for coatings)

RE.CNT 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(50) Yeske, P; EP 0743335 A2 1996 CAPLUS

10051818blessing

L23 ANSWER 1 OF 2 USPATFULL

ACCESSION NUMBER:	2002:106509 USPATFULL
TITLE:	Biocompatible pharmaceutical articles
INVENTOR(S):	Palasis, Maria, Wellsley, MA, UNITED STATES Naimark, Wendy, Cambridge, MA, UNITED STATES Mickley, Timothy, Elk River, MN, UNITED STATES Crank, Justin, Minneapolis, MN, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2002055721	A1	20020509
APPLICATION INFO.:	US 2001-845092	A1	20010427 (9)

RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1999-429178, filed on 28 Oct 1999, PENDING Continuation-in-part of Ser. No. US 2000-503586, filed on 14 Feb 2000, PENDING
DOCUMENT TYPE:	Utility
FILE SEGMENT:	APPLICATION
LEGAL REPRESENTATIVE:	MAYER, FORTKORT & WILLIAMS, PC, 251 NORTH AVENUE WEST, 2ND FLOOR, WESTFIELD, NJ, 07090
NUMBER OF CLAIMS:	43
EXEMPLARY CLAIM:	1
NUMBER OF DRAWINGS:	12 Drawing Page(s)
LINE COUNT:	1469

AB Many conventional pharmaceutical articles contain seemingly inert components that come into contact with a pharmaceutically active material during use, which contact substantially reduces the pharmaceutical effectiveness of the pharmaceutically active material. The invention described herein concerns various modifications to these incompatible components, which are effective to diminish the reduction in pharmaceutical effectiveness.

DETD . . . as hyaluronic acid, laminin, fibronectin, fibrin, and collagen, as well as glucans and glycosaminoglycans, such as dextrans, dextran sulfate and **heparin**; synthetic polymers such as polyethylene glycol, polyethylene oxide, polyvinyl pyrrolidone, poloxamers, polyethylenimine, protamine sulfate, polyamidoamine **dendrimers**, amphiphilic peptides, RGD-oligolysine peptides, and fluorocarbons such as polytetrafluoroethylene (further synthetic polymers are listed below); contrast agents such as iohexol,. . .

DETD . . . polyacrylamides; resins including alkyd resins, phenolic resins, urea resins, melamine resins, epoxy resins, allyl resins and epoxide resins; polycarbonates; polyacrylonitriles; **polyvinylpyrrolidones** (cross-linked and otherwise); anhydride polymers and copolymers including maleic anhydride polymers; polymers and copolymers of vinyl monomers including polyvinyl alcohols,. . .

10051818blessing

L23 ANSWER 2 OF 2 USPATFULL

ACCESSION NUMBER:	2001:234992 USPATFULL
TITLE:	Nanogel networks and biological agent compositions thereof
INVENTOR(S):	Kabanov, Alexander V., Omaha, NE, United States Vinogradov, Sergey V., Omaha, NE, United States
PATENT ASSIGNEE(S):	Supratek Pharma, Inc., Canada (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6333051	B1	20011225
APPLICATION INFO.:	US 1998-146651		19980903 (9)

DOCUMENT TYPE:	Utility
FILE SEGMENT:	GRANTED
PRIMARY EXAMINER:	Riley, Jezia
LEGAL REPRESENTATIVE:	Mathews, Collins, Shepherd & Gould, P.A.
NUMBER OF CLAIMS:	12
EXEMPLARY CLAIM:	1
LINE COUNT:	2246

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Copolymer networks having at least one cross-linked polyamine polymer fragment and at least one nonionic water-soluble polymer fragment, and compositions thereof, having at least one suitable biological agent.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM . . . a polyethylene oxide, a copolymer of ethylene oxide and propylene oxide, a polysaccharide, a polyacrylamide, a polygycerol, a polyvinylalcohol, a **polyvinylpyrrolidone**, a polyvinylpyridine N-oxide, a copolymer of vinylpyridine N-oxide and vinylpyridine, a polyoxazoline, or a polyacroylmorpholine or the derivatives thereof.

SUMM . . . cell. Such natural and synthetic polymers can be cationic, anionic or nonionic include homopolymers, copolymers, block copolymers, graft copolymers or **dendrimers** of ethylene oxide, propylene oxide, butylene oxide, carbohydrates, acrylamide, acrylic esters, methacrylamide, N-(2-hydroxypropyl)methacrylamide, vinyl alcohol, vinyl pyrrolidone, vinyltriazole, vinylpyridine and its N-oxide, ortho esters, amino acids, nucleic acids, acrylic acid, methacrylic acid, **heparin**, phosphate, malic acid, lactic acid, carboxylated dextran, alkylene imine, ethyleneimine, amidoamines, vinylpyridinium salts, ionenes methacrylates, dimethylaminoethyl methacrylate, trimethylamonioethyl methacrylate and. . .

10051818blessing

L16 ANSWER 1 OF 2 USPATFULL
ACCESSION NUMBER: 2003:37120 USPATFULL
TITLE: Polymeric delivery systems
INVENTOR(S): Griffiths, Gary L., Morristown, NJ, UNITED STATES
PATENT ASSIGNEE(S): Immunomedics, Inc. (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2003026764	A1	20030206	
APPLICATION INFO.:	US 2002-209592	A1	20020731	(10)

	NUMBER	DATE	
PRIORITY INFORMATION:	US 2001-308605P	20010731	(60)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: FOLEY AND LARDNER, SUITE 500, 3000 K STREET NW, WASHINGTON, DC, 20007
NUMBER OF CLAIMS: 20
EXEMPLARY CLAIM: 1
LINE COUNT: 1995
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB The present invention relates to a method of targeting an agent towards a targeting site in a tissue comprising administering a multi-specific antibody or antibody fragment comprising a targeting arm and a capture arm that binds to a polymer conjugate, and administering a polymer conjugate to the tissue. The present invention also relates to a kit for targeting a target site within a comprising a multi-specific antibody or antibody fragment comprising a targeting arm and a capture arm that binds to a polymer conjugate, and a polymer conjugate.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
CLM What is claimed is:
. . . (PEG), derivatives of PEG, co-polymers of PEG, N-(2-hydroxypropyl)methacrylamide (HPMA), polystyrene-co-maleic acid/anhydride (SMA), polyvinylether maleic anhydride (DIVEMA), polyethyleneimine, ethoxylated ploye**thyleneimine**, starburst **dendrimers**, **polyvinylpyrrolidone** (PVP), apometallothionein and calicheamicin.

L16 ANSWER 2 OF 2 USPATFULL
ACCESSION NUMBER: 2002:346297 USPATFULL
TITLE: Acicular particle ink formulation for an inkjet printer system
INVENTOR(S): Busby, Miles T., Charlotte, NC, United States
Bailey, Michael E., Waxhaw, NC, United States
Fox, James E., Warks, UNITED KINGDOM
Hudd, Alan L., Herts, UNITED KINGDOM
PATENT ASSIGNEE(S): Source Technologies, Inc., Charlotte, NC, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 6499839	B1	20021231	
	WO 2000047419		20000817	
APPLICATION INFO.:	US 2000-647759		20001004	(9)
	WO 2000-US3255		20000208	

	NUMBER	DATE	
PRIORITY INFORMATION:	US 1999-119367P	19990209	(60)

10051818blessing

US 1999-119227P 19990209 (60)
DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Barlow, John
ASSISTANT EXAMINER: Shah, Manish S.
LEGAL REPRESENTATIVE: Kennedy Covington Lobdell & Hickman, LLP
NUMBER OF CLAIMS: 109
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 6 Drawing Figure(s); 6 Drawing Page(s)
LINE COUNT: 979

AB A method for inkjet printing using an ink comprised of an acicular pigment and a solvent in an inkjet printer to print on a recording medium wherein the inkjet printer has an ink reservoir and a print head. The method comprises obtaining the ink comprised of the acicular pigment and the solvent wherein the ink has a first viscosity, filling the ink reservoir of the inkjet printer with the ink, flowing the ink from the ink reservoir to the print head of the inkjet printer, and jetting the ink from the print head of the inkjet printer and onto the recording medium, wherein the ink has a second viscosity upon exiting the print head. An ink formulation(s) comprised of an acicular pigment and a solvent for use in printing images with an inkjet printer. An ink cartridge and an inkjet printing system compatible with an ink comprised of an acicular pigment.

DETD . . . are not limited to, modified alkynes, silanes, silicones, polysiloxanes, polyphosphates, transition metal complexes, titanates, zirconates, polyacrylate copolymers, urethanes, phosphonates, polyamides, **dendrimers**, **polyvinylpyrrolidone** copolymers, lecithins, isocyanates, alkyds, and melamines. Preferred dispersants of the present invention are transition metal complexes. More preferred are titanates. . .

CLM What is claimed is:

. . . selected from the group consisting of modified alkynes, silanes, silicones, polysiloxanes, polyphosphates, transition metal complexes, polyacrylate copolymers, urethanes, phosphonates, polyamides, **dendrimers**, **polyvinylpyrrolidone** copolymers, lecithins, isocyanates, alkyds, melamines, and a combination thereof.

. . . selected from the group consisting of modified alkynes, silanes, silicones, polysiloxanes, polyphosphates, transition metal complexes, polyacrylate copolymers, urethanes, phosphonates, polyamides, **dendrimers**, **polyvinylpyrrolidone** copolymers, lecithins, isocyanates, alkyds, and melamines, and a combination thereof.

10051818blessing

L15 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2003 ACS

AB The use of polyamidoamine dendrimers as coatings for carbon fibers was examd. The effect of the coating on interfacial behavior was investigated using the single fiber fragmentation technique and the results point to the potential for tailoring fiber-matrix interfaces.

ACCESSION NUMBER: 1997:485278 CAPLUS
DOCUMENT NUMBER: 127:136386
TITLE: **Dendrimer coatings** for carbon fibers
AUTHOR(S): Palmese, Giuseppe R.; Mcknight, Steven H.; Phillips, C. Bruce
CORPORATE SOURCE: Center for Composite Materials, University of Delaware, Newark, DE, 19716, USA
SOURCE: Proceedings of the Annual Meeting of the Adhesion Society (1997), 20th, 49-51
CODEN: PAMSFE; ISSN: 1086-9506
PUBLISHER: Adhesion Society
DOCUMENT TYPE: Journal
LANGUAGE: English

10051818blessing

L15 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2003 ACS
AN 1997:485278 CAPLUS
DN 127:136386
TI **Dendrimer coatings** for carbon fibers
AU Palmese, Giuseppe R.; Mcknight, Steven H.; Phillips, C. Bruce
CS Center for Composite Materials, University of Delaware, Newark, DE, 19716, USA
SO Proceedings of the Annual Meeting of the Adhesion Society (1997), 20th, 49-51
CODEN: PAMSFE; ISSN: 1086-9506
PB Adhesion Society
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
AB The use of polyamidoamine dendrimers as coatings for carbon fibers was examd. The effect of the coating on interfacial behavior was investigated using the single fiber fragmentation technique and the results point to the potential for tailoring fiber-matrix interfaces.
ST polyamidoamine **dendrimer coating** carbon fiber; adhesion promoter polyamidoamine dendrimer
IT Adhesion, physical
(interfacial; polyamidoamine **dendrimer coating** of carbon fibers for improved fiber-matrix interfacial adhesion)
IT Polyamines
Polyamines
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(polyamide-, dendrimers; polyamidoamine **dendrimer coating** of carbon fibers for improved fiber-matrix interfacial adhesion)
IT Dendritic polymers
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(polyamide-polyamine-; polyamidoamine **dendrimer coating** of carbon fibers for improved fiber-matrix interfacial adhesion)
IT Carbon fibers, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(polyamidoamine **dendrimer coating** of carbon fibers for improved fiber-matrix interfacial adhesion)
IT Polyamides, properties
Polyamides, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(polyamine-, dendrimers; polyamidoamine **dendrimer coating** of carbon fibers for improved fiber-matrix interfacial adhesion)

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Search Results - Record(s) 1 through 10 of 10 returned.

☐ 1. Document ID: US 20030114583 A1

L37: Entry 1 of 10 File: PGPB Jun 19, 2003

PGPUB-DOCUMENT-NUMBER: 20030114583
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030114583 A1

TITLE: Hydrophobicized copolymers

PUBLICATION-DATE: June 19, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Stark, Kurt	Burgkirchen		DE	
Zeh, Harald	Burghausen		DE	
Bueppelmann, Klaus	Emmerting		DE	

US-CL-CURRENT: 524/588

ABSTRACT:

Functionalized copolymers hydrophobicized with silicones, in the form of aqueous dispersions or water-redispersible powders are prepared by copolymerizing

a) from 60 to 99.89% by weight of one or more monomers selected from the group consisting of vinyl esters of optionally branched C.sub.1-15 alkylcarboxylic acids, methacrylates and acrylates of C.sub.1-15 alcohols, vinylaromatics, olefins, dienes, and vinyl halides,

b) from 0.01 to 30% by weight of one or more silicones with from 10 to 1,000 SiO(C.sub.nH.sub.2n+1).sub.2 repeat units where n is from 1 to 6, and where from 90 to 100% by weight of the silicones b) contain at least one but not more than two polymerizable groups,

c) from 0.05 to 5.0% by weight of one or more hydrolyzable silane monomers selected from the group consisting of ethylenically unsaturated hydrolyzable silicon compounds, and hydrolyzable epoxysilanes, aminosilanes and mercaptosilanes, and

d) from 0.05 to 5.0% by weight of one or more monomers selected from the group consisting of ethylenically unsaturated epoxy compounds.

The copolymers may be used as binders for paints and coatings with high wet abrasion resistance.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw Desc | Image

☐ 2. Document ID: US 6534590 B1

L37: Entry 2 of 10 File: USPT Mar 18, 2003

US-PAT-NO: 6534590
DOCUMENT-IDENTIFIER: US 6534590 B1

TITLE: Silicone-grafted vinyl copolymer emulsion composition

DATE-ISSUED: March 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Aso; Takayuki	Chiba Prefecture			JP
Furukawa; Haruhiko	Chiba Prefecture			JP
Morita; Yoshitsugu	Chiba Prefecture			JP

US-CL-CURRENT: 524/806; 106/287.16, 427/387, 526/279, 526/911

ABSTRACT:

The present invention provides a highly storage-stable silicone-grafted vinyl copolymer emulsion composition that can produce films and coatings that are highly water repellent, water resistant, adhesive, and printable, the composition including (A) vinyl monomer, (B) carbosiloxane dendrimer that contains a radically polymerizable organic group, (C) surfactant, and (D) radical polymerization initiator.

4 Claims, 0 Drawing figures
Exemplary Claim Number: 1

☐ 3. Document ID: US 6515192 B1

L37: Entry 3 of 10 File: USPT Feb 4, 2003

US-PAT-NO: 6515192
DOCUMENT-IDENTIFIER: US 6515192 B1

TITLE: Hyperbranched compounds with a tetrafunctional central group and use of same

DATE-ISSUED: February 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rink; Heinz-Peter	Munster			DE
Mikolajetz; Dunja	Munster			DE

US-CL-CURRENT: 585/16; 106/316, 260/1, 524/80

ABSTRACT:

Hyperbranched compounds having a tetrafunctional central group of the general formula I

C[--A.sub.q --X--].sub.m [--A.sub.r --X--].sub.n [--A.sub.s --X--].sub.o [--A.sub.t --X--].sub.p (I),

in which the indices and variables have the following meanings:

m+n+o+p=4; where m=an integer from 1 to 3 and n, o and p=0 or an integer from 1 to 3; q,r,s and t=an integer from 1 to 5, where q>r, s and t; X=--O--, --S-- or --NH--; A=--CR.sub.2 --; where R=--H, --F, --Cl, --Br, --CN, --NO.sub.2, C.sub.1 -C.sub.3

alkyl or C.sub.1 -C.sub.3 haloalkyl or C.sub.1 -C.sub.3 alkoxy radical or, if q, r, s and/or t=at least 2, a C.sub.2 -C.sub.4 alkanediyl and/or C.sub.2 -C.sub.4 oxaalkanediyl radical which bridges 2 to 5 carbon atoms, and/or an oxygen atom --O--, which bridges 3 to 5 carbon atoms, of the radical --A--.

19 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 6395860 B1

L37: Entry 4 of 10 File: USPT May 28, 2002

US-PAT-NO: 6395860
DOCUMENT-IDENTIFIER: US 6395860 B1

TITLE: Clearcoat composition with improved scratch and mar resistance

DATE-ISSUED: May 28, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ramesh; Swaminathan	Canton	MI		
Gupta; Manoj K.	Troy	MI		

US-CL-CURRENT: 528/59; 252/182.22, 528/81, 560/115, 560/26

ABSTRACT:

The polyisocyanate ester compound is a branched material having at least two ester linkages, at least four urethane linkages further from the center of the compound compared to the ester linkages, and at least one terminal isocyanate group for each urethane linkage, which isocyanate group may be blocked. The compound can be prepared by first by reacting a polyol compound having at least two hydroxyl groups with a carboxylic acid compound having one carboxylic acid group and at least two hydroxyl groups to form a hydroxyl-functional ester product. The hydroxyl-functional ester product is then reacted with a polyisocyanate compound in which the isocyanate groups have different reactivities. The reaction with the polyisocyanate compound is carried out under conditions so that only one of the isocyanate groups is substantially reactive with the hydroxyl groups of the ester product of the first stage.

30 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 6187897 B1

L37: Entry 5 of 10 File: USPT Feb 13, 2001

US-PAT-NO: 6187897
DOCUMENT-IDENTIFIER: US 6187897 B1

TITLE: Vinyl-group-containing dendrimer and curable composition

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawashima; Miki	Tokyo			JP
Nakamura; Minoru	Tokyo			JP
Tanaka; Hiroaki	Tokyo			JP

US-CL-CURRENT: 528/310; 424/DIG.16, 524/252, 525/410, 525/418, 525/419, 528/332, 528/363, 528/373

ABSTRACT:

A vinyl-group-containing dendrimer useful in coating and printing and is curable by any one of conventional triggers such as heating, ultraviolet light, infrared light, electron beams and .gamma. rays, the composition comprising a vinyl-group-containing dendrimer (A) comprising a core portion, branching portions, branches and at least 4 terminal portions and having a vinyl group as a terminal portion and a long-chain group and a curable unsaturated-group-containing compound (B), and the composition comprising a vinyl-group-containing dendrimer (A) obtained by reacting a polyfunctional compound (a) having at least three active-hydrogen-containing groups in a terminal per molecule and having at least five active hydrogen atoms per molecule with a long-chain-group-containing compound (b) having a functional group reactive with an active hydrogen atom so as to leave part of the active hydrogen atoms, thereby obtaining a long-chain-group-containing multi-branched compound (X), and reacting the long-chain-containing multi-branched compound (X) with a vinyl-group-containing compound (c) having a functional group reactive with an active hydrogen atom and a curable unsaturated-group-containing compound (B).

20 Claims, 7 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

☐ 6. Document ID: US 6037444 A

L37: Entry 6 of 10 File: USPT Mar 14, 2000

US-PAT-NO: 6037444
DOCUMENT-IDENTIFIER: US 6037444 A

TITLE: Selective chemical reactions and polymers of controlled architecture produced thereby

DATE-ISSUED: March 14, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rannard; Steven Paul	Stratford-Upon-Avon			GB
Davis; Nicola Jane	Coventry			GB

US-CL-CURRENT: 528/423; 528/367, 528/368, 528/369, 528/422

ABSTRACT:

A process for the preparation of a compound or polymer having at least one functional group selected from hydroxyl, thiol, amino and carboxylic acid groups is characterized in that a compound or polymer (A) containing a group of formula (I), ##STR1## where Q represents O or S and X represents --O--, --S--, --NH-- or a direct bond, the group

being linked to the remainder of the compound or polymer through a carbon atom, is reacted with a compound (B) containing at least two functional groups selected from hydroxyl, thiol, amino and carboxylic acid groups, one of which functional groups (II) reacts with the group of formula (I) and one of which functional groups (III) is substantially unreactive with the group of formula (I) under the conditions of reaction, so that the compound (B) becomes bonded to (A) through the reaction of groups (I) and (II) forming a compound or polymer containing unreacted functional groups (III). The invention also includes dendritic polymers obtainable by the process and intermediates obtainable in the process.

47 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 7. Document ID: US 5959067 A

L37: Entry 7 of 10 File: USPT Sep 28, 1999

US-PAT-NO: 5959067
DOCUMENT-IDENTIFIER: US 5959067 A

TITLE: Alkyd resins having a low dynamic viscosity for use in high-solids coatings

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bakker; Petrus Josephus	Bergen op Zoom			NL
Boekee; Dick	Voorhout			NL

US-CL-CURRENT: 528/295.3; 428/480, 528/272, 528/295.5, 528/300, 528/301, 528/302, 528/303, 528/304, 528/306, 528/361

ABSTRACT:

The current invention relates to an alkyd resin particularly useful in high-solids coating compositions. The alkyd resin comprises the reaction product of an unsaturated fatty acid, a polyol, and the adduct of an .alpha.,.beta.-unsaturated dicarboxylic acid to an unsaturated fatty acid wherein the resin contains

a) about 5 to about 40 weight % of the adduct of an .alpha.,.beta.-unsaturated dicarboxylic acid to an unsaturated fatty acid,

b) about 50 to about 90 weight % of an unsaturated fatty acid which is not part of an adduct,

c) about 8 to about 18 weight % of a polyol free from carboxylic groups,

d) about 1 to about 30 weight % of an at least two hydroxyl groups-containing monocarboxylic acid,

e) optionally, up to about 10 weight % of a dicarboxylic and/or a tricarboxylic acid, and

f) optionally, up to 15 weight % of one or more monomers other than the monomers (a) through (e).

Also disclosed is their use in coating compositions, particularly high-solids coating compositions having a VOC of less than 170.

12 Claims, 0 Drawing figures
Exemplary Claim Number: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 8. Document ID: US 5731095 A

L37: Entry 8 of 10 File: USPT Mar 24, 1998

US-PAT-NO: 5731095
DOCUMENT-IDENTIFIER: US 5731095 A
**** See image for Certificate of Correction ****

TITLE: Dendritic polymer coatings

DATE-ISSUED: March 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Milco; Larry A.	Midland	MI		
Tomalia; Donald A.	Midland	MI		

US-CL-CURRENT: 428/482; 524/801, 524/802, 524/805, 524/839, 525/437, 525/440, 525/540, 528/288, 528/290, 528/299, 528/401

ABSTRACT:

A water-soluble or water-dispersible fluorine-containing dendritic polymer surfactant having at least one terminal fluorocarbon moiety and at least one terminal anionic moiety, and which is suitable for use in preparing protective coating compositions is disclosed. The water-soluble or water-dispersible fluorine-containing dendritic polymer surfactants are represented by the general formula: ##STR1## where D represents a dendritic polymer, R.sub.F represents a fluorocarbon containing moiety, A.sup.- represents an anionic containing moiety, C.sup.+ represents a cation, T represents a terminal group of the dendritic polymer which has not been functionalized with a fluorocarbon or anionic moiety, n and m are at least each at least one, and the sum of n+m+q is the total number of terminal groups on the dendritic polymer. Also disclosed is a coating composition capable of forming a highly crosslinked, non-stick, protective coating. The coating composition includes a water-soluble or water-dispersible fluorine-containing dendritic polymer surfactant having at least one terminal fluorocarbon moiety and at least one terminal anionic moiety, an oxazoline crosslinking agent, and a water-based solvent.

41 Claims, 1 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 9. Document ID: DE 59905217 G DE 19840605 A1 WO 200014049 A1 AU 9957365 A EP 1109775 A1 BR 9913460 A CN 1315933 A KR 2001074959 A JP 2002524437 W US 6515192 B1 EP 1109775 B1

L37: Entry 9 of 10 File: DWPI May 28, 2003

DERWENT-ACC-NO: 2000-257780
DERWENT-WEEK: 200336

TITLE: Hyper-branched compound with a tetrafunctional central group is used for the preparation of higher generation dendrimer compounds

INVENTOR: MIKOLAJETZ, D; RINK, H

PRIORITY-DATA: 1998DE-1040605 (September 5, 1998), 2000JP-0568809 (August 18, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 59905217 G	May 28, 2003		000	C07C069/003
DE 19840605 A1	March 9, 2000		017	C08G063/58
WO 200014049 A1	March 16, 2000	G	000	C07C069/003
AU 9957365 A	March 27, 2000		000	C07C069/003
EP 1109775 A1	June 27, 2001	G	000	C07C069/003
BR 9913460 A	July 24, 2001		000	C07C069/003
CN 1315933 A	October 3, 2001		000	C07C069/003
KR 2001074959 A	August 9, 2001		000	C07C069/003
JP 2002524437 W	August 6, 2002		047	C07C069/75
US 6515192 B1	February 4, 2003		000	C07C069/003
EP 1109775 B1	April 23, 2003	G	000	C07C069/003

INT-CL (IPC): C07 C 69/003; C07 C 69/54; C07 C 69/75; C07 C 229/24; C08 G 63/58; C08 G 83/00; C08 G 85/00; C09 D 5/03; C09 D 5/46; C09 D 7/02; C09 D 7/12; C09 D 133/04; C09 D 167/00; C09 D 175/04; C09 D 201/00; C09 J 11/06; C09 J 133/04; C09 J 201/00; C09 K 3/10

ABSTRACTED-PUB-NO: DE 19840605A

BASIC-ABSTRACT:

NOVELTY - Hyper-branched compound, giving air dryable, thermally curable compositions, has a tetrafunctional central group.

DETAILED DESCRIPTION - Hyper-branched compound with a tetrafunctional central group is of formula (I):

C(AqX)m(SrX)n(AsX)o(AtX)p (I)

A = CR2;

R = H, F, Cl, Br, CN, NO2, 1-3C (halo)alkyl or alkyl or, when q, r, s and/or t is at least 2, also 2-4C alkandiyl and/or oxalkandiyl having 2-5C and/or an O atom bridging 3-5C atoms of A;

X = O, S or NH;

m+n+o+p = 4; and

q, r, s and t = 1-5, where q is larger than r, s and t.

INDEPENDENT CLAIMS are included for multicomponent mixtures and higher generation dendrimer compounds containing the above compound, especially coating compositions, adhesives and sealants for spray paints, liquid paints, powder paints and powder slurries for the industrial, furniture, building, automobile and automobile repair industries (all claimed).

USE - As functional components in multicomponent mixtures and in the preparation of higher generation dendrimer compounds (claimed).

ADVANTAGE - The coatings are air dryable and curable thermally, using actinic light or electron radiation (claimed).

☐ 10. Document ID: JP 3353677 B2 EP 899286 A1 JP 11140042 A JP 2927291 B2 JP 11193315 A JP 11193316 A JP 11193317 A JP 11193318 A JP 3008936 B2 JP 2000026597 A US 6136943 A US 6187897 B1 JP 2002187947 A

L37: Entry 10 of 10 File: DWPI Dec 3, 2002

DERWENT-ACC-NO: 1999-144768
DERWENT-WEEK: 200281

TITLE: Vinyl-group-containing dendrimer is formed for use in producing a curable composition - which can be used to form films, coatings, inks and adhesives which are radiation curable

INVENTOR: KAWASHIMA, M; NAKAMURA, M ; TANAKA, H

PRIORITY-DATA: 1997JP-0301459 (November 4, 1997), 1997JP-0235743 (September 1, 1997), 1997JP-0242261 (September 8, 1997), 1997JP-0295966 (October 28, 1997), 1997JP-0295967 (October 28, 1997), 1997JP-0301458 (November 4, 1997), 1997JP-0293697 (October 27, 1997), 1997JP-0293698 (October 27, 1997), 1998JP-0020749 (February 2, 1998)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 3353677 B2	December 3, 2002		019	C07C269/04
EP 899286 A1	March 3, 1999	E	066	C08G083/00
JP 11140042 A	May 25, 1999		024	C07C271/20
JP 2927291 B2	July 28, 1999		024	C08F290/06
JP 11193315 A	July 21, 1999		027	C08F290/06
JP 11193316 A	July 21, 1999		028	C08F290/06
JP 11193317 A	July 21, 1999		024	C08F290/06
JP 11193318 A	July 21, 1999		025	C08F290/06
JP 3008936 B2	February 14, 2000		017	C08F290/06
JP 2000026597 A	January 25, 2000		023	C08G073/00
US 6136943 A	October 24, 2000		000	C08G083/00
US 6187897 B1	February 13, 2001		000	C08G063/00
JP 2002187947 A	July 5, 2002		012	C08G065/325

INT-CL (IPC): C07 C 269/04; C07 C 271/16; C07 C 271/20; C07 C 275/14; C08 F 20/36; C08 F 290/06; C08 F 299/00; C08 G 63/00; C08 G 65/325; C08 G 69/48; C08 G 73/00; C08 G 73/02; C08 G 83/00; C08 L 55/00; C08 L 101/00; C08 L 101/12; C09 D 4/02; C09 D 5/00; C09 D 11/10; C09 D 133/14; C09 D 155/00; C09 D 179/02; C09 D 201/00 ; C09 J 133/14; C09 J 155/00; C09 J 175/16; C09 J 179/02

ABSTRACTED-PUB-NO: EP 899286A
BASIC-ABSTRACT:

A vinyl-gp-contg dendrimer comprises a core portion; at least one branching portion; and at least 4 terminal portions, each terminal portion being bonded via a branch to one of the branching portions or to the core portion, and at least one branching portion being bonded,via a branch, to the core portion, where the dendrimer contains, as terminal portions: at least one vinyl gp; and at least one long-chain gp selected from the gps -Cn-H2nR1, (CxH2xO)mR2 or -CyH2yO(COC2H22O)kR2; or at least one active-hydrogen-contg gp selected from gps -NHR3, where R3 = H or 1-3C alkyl, -COOH, -OH, -Si(OR4)3-h(OH)h or -P=O(OH)2; where R1 is a phenyl gp or a hydrogen atom, n = 4-25, x = 1-6, R2 = phenyl or 1-22C, y = 2-22, z = 2-15, m = 1-25 and k =1-20. R3 = H or 1-3C alkyl where R4 = 1-8Calkyl gp or a phenyl gp and h = 1-3. Also claimed is (I) a curable compsn comprising (A) 5-99 wt% of a vinyl-gp-contg dendrimer and (B) 1-95

wt% of a polymerizable unsatd-gp-contg cpd other than the vinyl-gp-contg dendrimer (A) (II) a curable ink contg a curable resin compsn and (III) a coating compsn contg the curable compsn.

USE - A vinyl-gp -contg dendrimer is produced which can be used to form films, coatings, inks, adhesives which are radiation curable.

ADVANTAGE - The dendrimer can reduce the amt of low-molecular wt cpd having safety and performance problems and produces a resin compsn having a high molecular wt but low viscosity and having excellent performances as a coating or film.
ABSTRACTED-PUB-NO:

US 6136943A EQUIVALENT-ABSTRACTS:

A compound is obtained by reacting a core compound obtainable from a Michael addition reaction of a polyamino compound (a) having primary or secondary amino group(s)and an active H-containing (meth)acrylic compound (b1) with a vinyl group-containing compound (c) having a functional group reactable with the active H.

Also claimed are (I) a curable composition containing the claimed compound, water and/or another solvent; (II) a printing ink or coating composition containing the claimed composition; and (III) a cured product obtainable by curing a claimed compound or composition.

USE - The compound is used as a film forming material such as a coating composition, an ink, a resin for a sealant, a moulding material, an adhesive or tackiness agent, a curing agent or reactive diluent.

ADVANTAGE - The compound can give a liquid compound having a relatively high molecular weight but a low viscosity and having excellent coating performances, or a solventless resin composition having sufficient coating performances and having a low viscosity sufficient for coating. It also decreases the amount of a low molecular weight compound having performance problems.

US 6187897B

A vinyl-gp-contg dendrimer comprises a core portion; at least one branching portion; and at least 4 terminal portions, each terminal portion being bonded via a branch to one of the branching portions or to the core portion, and at least one branching portion being bonded,via a branch, to the core portion, where the dendrimer contains, as terminal portions: at least one vinyl gp; and at least one long-chain gp selected from the gps -Cn-H2nR1, (CxH2xO)mR2 or -CyH2yO(COC2H22O)kR2; or at least one active-hydrogen-contg gp selected from gps -NHR3, where R3 = H or 1-3C alkyl, -COOH, -OH, -Si(OR4)3-h(OH)h or -P=O(OH)2; where R1 is a phenyl gp or a hydrogen atom, n = 4-25, x = 1-6, R2 = phenyl or 1-22C, y = 2-22, z = 2-15, m = 1-25 and k =1-20. R3 = H or 1-3C alkyl where R4 = 1-8Calkyl gp or a phenyl gp and h = 1-3. Also claimed is (I) a curable compsn comprising (A) 5-99 wt% of a vinyl-gp-contg dendrimer and (B) 1-95 wt% of a polymerizable unsatd-gp-contg cpd other than the vinyl-gp-contg dendrimer (A) (II) a curable ink contg a curable resin compsn and (III) a coating compsn contg the curable compsn.

USE - A vinyl-gp -contg dendrimer is produced which can be used to form films, coatings, inks, adhesives which are radiation curable.

ADVANTAGE - The dendrimer can reduce the amt of low-molecular wt cpd having safety and performance problems and produces a resin compsn having a high molecular wt but low viscosity and having excellent performances as a coating or film.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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Term	Documents
DENDRIMER	1293
DENDRIMERS	1601
(DENDRIMER SAME 32).USPT,PGPB,JPAB,EPAB,DWPI.	10
(L32 SAME DENDRIMER).USPT,PGPB,JPAB,EPAB,DWPI.	10

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L41: Entry 12 of 21 File: USPT Aug 8, 2000

DOCUMENT-IDENTIFIER: US 6099563 A
**** See image for Certificate of Correction ****
TITLE: Substrates, particularly medical devices, provided with bio-active/biocompatible coatings

Brief Summary Text (2):
This invention relates generally to bio-active substrate coatings. More particularly, the present invention relates to a method for providing a medical device or a part thereof with a bio-active coating which enhances the antithrombogenic nature of such a device without the use of solvents and/or the need for high temperature curing. Coatings and devices incorporating such coatings are also described.

Brief Summary Text (4):
It is generally known to provide a substrate, such as a medical device or parts of such a device with bio-active coatings for the purpose of enhancing the bio-compatibility of the device when it is introduced into a mammal, such as a human body.

Brief Summary Text (8):
International Patent Applications Nos. PCT/EP92/00918, PCT/EP92/00919 and PCT/DK92/00132 disclose methods for providing medical devices having polyurethane surfaces with a hydrophilic coating of poly(meth)acrylamide. Before application of the hydrophilic coating to the poly(meth)acrylamide substrate surface, it is treated with a compound having functional groups capable of reacting with the polyurethane and the poly(meth)acrylamide, respectively. This compound is typically a di- or higher isocyanate functionality in an organic solvent.

Brief Summary Text (11):
For example, EP Patent Application Nos. 92100787.8 and EP 0 496 305 A2 disclose methods for preparing a shaped medical article with a lubricous coating. In these methods, a coating composition that includes a blend of polyurethane and polyvinylpyrrolidone is co-extruded with a substrate polymer to produce a shaped article having on a surface thereof a layer of the coating composition which becomes lubricous when contacted with water.

Brief Summary Text (15):
Although the use of organic solvents is eliminated in this method, high curing temperatures must be applied to bond the inner layer to the outer layer. These high curing temperatures are not useful on heat-sensitive materials, as well as, heat-sensitive biomolecules. Thus, heat-sensitive substrates, such as poly(ethylene terephthalate) (PET) balloon catheters cannot be used with this material. Moreover, molecules such as nucleic acids, proteins, peptides, hormones, heparin and the like are heat-sensitive biomolecules which cannot be exposed to such high temperatures without losing their activity.

Brief Summary Text (16):
The art is not limited, however, to medical devices having lubricious coatings disposed on a surface thereof. Rather, medical articles or devices coated with bio-compatible or bio-active agents have also been described, some of which are set forth below. All of these patents employ various inefficient and/or harsh methods for attaching the bio-compatible/bio-active agent to the surface of a medical article.

Brief Summary Text (17):
For example, U.S. Pat. No. 5,541,167 describes a thrombo-resistant and defoaming coating for blood contacting surfaces including bubble oxygenators, blood filters, etc. This coating includes a commercial preparation of polydimethylsiloxane and

silicon dioxide and a quarternary ammonium complex of heparin, such as stearyldimethylbenzyl. This coating, however, suffers from the drawback that the defoaming and heparin components are dissolved in an organic solvent, such as methylene chloride. Such solvents can denature and reduce the bio-activity of bio-active agent, such as heparin. Furthermore, such organic solvent systems produce environmentally hazardous waste, as well as attacking certain polymer substrates.

Brief Summary Text (18):
In a different approach to rendering an implantable medical device bio-compatible, U.S. Pat. No. 5,360,397 describes a porous bio-compatible and bio-stable polyurethane mesh for a catheter made from polycarbonate urethane. This mesh is sputter coated and/or impregnated with a bio-active agent, such as for example, a bactericide. A catheter treated in such a manner, however, is imparted with transient bio-activity at best because the bio-active agent is not covalently bound to the surface thereof. Furthermore, the process of making such a catheter is inefficient because the porous polyurethane mesh must be attached to the surface of the catheter prior to the application of the bio-active agent.

Brief Summary Text (19):
Still further, U.S. Pat. No. 5,263,992 describes a medical device having a bio-compatible coating which includes a bio-compatible agent, such as for example, heparin or streptokinase and a chemical linking moiety. This chemical linking moiety has a structure represented by: A-X-B, wherein A is a photochemically reactive group, B is a reactive group which responds to a different stimulus than A and X is a non-interfering skeletal moiety, such as a C.sub.1 -C.sub.10 alkyl. The bio-compatible agent is covalently linked to the surface of the medical device via the linking moiety. In particular, the photochemically reactive group (A) when activated covalently binds to the surface of the medical device. The remaining unreacted reactive group (B) when activated covalently binds to the bio-compatible agent and anchors it to the surface of the medical device. Such devices, however, are difficult and inefficient to produce because they require the use of two separate stimuli to activate the A and B groups of the chemical linking moiety, respectively. Furthermore, the UV light used to activate the A group of the chemical linking moiety for covalently binding it to the surface of a medical device can denature bio-active agents. Such denaturization reduces the bio-activity of such agents and can result in undesirable medical outcomes, such as, clot formation in the case of an anti-thrombogenic agent.

Brief Summary Text (20):
The present invention, however, is directed to a method of providing a substrate, particularly a medical device, or a part of such device, intended for introduction in the human body, with a bio-active coating which enhances the bio-compatibility of the substrate. This method is particularly advantageous because it makes it possible to coat devices which are sensitive to high processing temperatures, such as (PET) balloon catheters and other polymeric or heat sensitive materials or biomolecules. Moreover, the present invention discloses the use of two-component bio-compatible coatings which are both aqueous based. Such coatings are mutually soluble and do not pose the increased medical risks associated with coatings containing organic solvents. Furthermore, preparation of the present aqueous coatings is more efficient because vacuum baking substrates is not required as there are no organic solvents that must be removed. Moreover, because the bio-active surface is covalently bonded to the polymer of the first coating, this coating is permanently attached to the substrate unlike certain of the transient coatings discussed above.

Brief Summary Text (21):
In summary, the prior art methods suffer from the drawback that they use organic solvents in their coating layer and/or cure at high temperatures, are transient or inefficient to produce. Thus, there is a need for improved bio-active agentibio-compatible coatings which enhance the compatibility and abrasion-resistance of the surface of heat sensitive medical devices. In particular, there is a need for improved compositions and devices which have antithrombogenic properties and more efficient methods of providing same. The present invention is directed to meeting these and other needs.

Brief Summary Text (25):

In another embodiment of the present invention, there is provided a medical device having a bio-active coating on at least a portion of a surface thereof. This bio-active coating includes a first substantially water-insoluble coating layer formed from an aqueous dispersion or emulsion of an organic acid functional group-containing polymer and an excess of a polyfunctional cross-linking agent which is reactive with the organic acid groups on the polymer. This composition also includes a second coating of an aqueous solution or dispersion of a bio-active agent or its derivative which contain an organic acid functional group or metal salt thereof. The first coating is covalently bonded to the second coating through reaction of the excess cross-linking agent and the organic acid functional groups on the bio-active coating.

Brief Summary Text (43):
Non-limiting classes of useful bio-active agents of the present invention include antithrombogenic agents, antibiotic agents, anti-tumor agents, antiviral agents, anti-angiogenic agents, angiogenic agents, anti-mitotic agents, anti-inflammatory agents, angiostatin agents, endostatin agents, cell cycle regulation agents, genetic agents, including hormones, such as estrogen, their homologues, analogs, derivatives, fragments, pharmaceutical salts and mixtures thereof. Other useful bio-active agents include for example, viral reactors and growth hormones such as Fibroblast Growth Factor and Transforming Growth Factor-.beta., their homologues, analogs, derivatives, fragments, pharmaceutical salts and mixtures thereof. One specific type of bio-active material useful in the present invention is the class of organic acid functional group-containing polysaccharides. For purposes of the present invention, such polysaccharides include linear and branched polymers of monosaccharides. The preferred polysaccharide bio-active agents of the present invention are glycosaminoglycans (hereinafter "GAGs").

Brief Summary Text (44):
Glycosaminoglycans are unbranched polysaccharide chains of repeating disaccharide units. One of the repeating disaccharide units is usually an amino sugar (N-acetylglucosamine or N-acetylgalactosamine) which can be sulfated. The second sugar of the disaccharide unit is usually a uronic acid, such as for example, glucuronic or iduronic acid. Because there are sulfate or carboxyl groups on most of their sugar residues, GAGs are highly negatively charged and are ideal for covalently bonding to the first coating layers via the excess, unreacted functional groups on the cross-linking agent. GAGs which are useful as bio-active agents in the present invention include, for example, heparin, hirudin, heparin sulfate, hyaluronic acid, chondroitin sulfate, dermatan sulfate, keratan sulfate, EPA, prostoctein, reopro, integrin, lytic agents including urokinase and streptokinase, their homologs, analogs, fragments, derivatives and pharmaceutical salts thereof. Other GAG containing molecules are also contemplated by the present invention, for example GAG-containing proteins, such as proteglycans.

Brief Summary Text (45):
Moreover, the bio-active agent of the present invention can also include organic acid functional group-containing antibiotics. For purposes of the present invention, such antibiotics include penicillins, cephalosporins, vancomycins, aminoglycosides, quinolones, polymyxins, erythromycins, tetracyclines, chloramphenicols, clindamycins, lincomycins, sulfonamides their homologs, analogs, fragments, derivatives, pharmaceutical salts and mixtures thereof.

Brief Summary Text (46):
Additionally, the bio-active agent of the present invention can also include organic acid functional group-containing anti-tumor agents. For purposes of the present invention, such anti-tumor agents include paclitaxel, docetaxel, alkylating agents including mechlorethamine, chlorambucil, cyclophosphamide, melphalan and ifosfamide; antimetabolites including methotrexate, 6-mercaptopurine, 5-fluorouracil and cytarabine; plant alkaloids including vinblastine, vincristine and etoposide; antibiotics including doxorubicin, daunomycin, bleomycin, and mitomycin; nitrosureas including carmustine and lomustine; inorganic ions including cisplatin; biological response modifiers including interferon; enzymes including asparaginase; and hormones including estrogen, tamoxifen and flutamide their homologs, analogs, fragments, derivatives, pharmaceutical salts and mixtures thereof.

Brief Summary Text (48):

In certain cases, such bio-active agents may also become lubricous upon contact with an aqueous medium. Such lubricity will depend on a number of factors, including the type of bio-active agent, its molecular weight, the exposure level to the aqueous medium, as well as the presence of agents which facilitate wetting. In the present invention, the molecular weight of the bio-active agent can vary from fewer than 500 for paclitaxel to about 3,000 to about 30,000 for heparin to an excess of 8,000,000 for hyaluronic acid.

Brief Summary Text (50):
In one embodiment of the present invention, the functional groups of the cross-linking agent react with the organic acid functional groups of the polymer in the first coating and the organic acid functional groups of the bio-active agent at a temperature below 120.degree. C. Preferably, these reactions take place between about 10.degree. C. to about 70.degree. C. The drying step for the second coating is chosen based on the substrate and the compositions used in the first and second coatings. Many bio-active agents are temperature sensitive and extreme care must be taken in selecting the appropriate drying temperatures with such agents. For example, when heparin is the bio-active agent, the drying temperature should be no greater than about body temperature.

Brief Summary Text (56):
As set forth above, non-polymeric substrates may also be used in the present invention. These non-polymeric substrates include, for example ceramics, metals, glasses and the like. Furthermore, the substrates of the present invention may include a combination of one or more polymers and/or one or more non-polymers. Examples of metals employed in medical devices include, without limitation, stainless steel, superelastic materials (shape-memory) such as nitinol, gold, silver, titanium, tantulum, platinum and alloys thereof.

Brief Summary Text (57):
In another embodiment of the present invention, a medical device having a bio-active coating on at least a portion of a surface thereof is provided for use in conjunction with a body. The bio-active coating includes a first substantially water-insoluble coating layer formed from an aqueous dispersion or emulsion of an organic functional group-containing polymer and an excess of a polyfunctional cross-liking agent, each of which is described above. As set forth previously, the cross-linking agent is reactive with the organic acid groups of the polymer.

Detailed Description Text (11):
1.2% aqueous solution of Sodium Heparin (Abbott): 400 ml

Detailed Description Text (12):
The above solution is prepared by adding an appropriate amount of heparin powder to water under agitation for several hours to obtain a clear homogeneous solution.

Detailed Description Text (13):
A substrate is prepared by extruding a blend of two grades of polyether-ester block copolymer ARNITEL EM 740 and EM630 (from Akzo) with BaSO.sub.4, into a tube. The tube is dipped into the first coating composition prepared above and dried at ambient temperature (room temperature) for 40 minutes. Then the tube is dipped in the second coating composition and dried at ambient temperature over night to form a continuous coating of the heparin on the surface of the substrate. The coated surface shows very good antithrombogenic effect when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity. The coating is strongly retained on the surface even under the application of strong forces.

Detailed Description Text (21):
1.2% sodium heparin (Abbott) aqueous solution

Detailed Description Text (25):
First and second coating compositions are prepared as described in Example 2, with the exception that heparin sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its

bio-activity.

Detailed Description Text (27):
First and second coating compositions are prepared as described in Example 2 except that sodium hyaluronate (hyaluronic acid) is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (29):
First and second coating compositions are prepared as described in Example 2 except that chondroitin sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (31):
First and second coating compositions are prepared as described in Example 2 except that derrnatan sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (33):
First and second coating compositions are prepared as described in Example 2 except that keratan sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (43):
Heparin: 400 ml of Sodium Heparin (Abbott) in 1% Versicol WN23

Detailed Description Text (54):
1.0% aqueous solution of Sodium Heparin (Abbot): 400 ml

Detailed Description Text (65):
0.8% sodium heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (76):
1% Sodium Heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (87):
1% sodium heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (97):
1% sodium heparin (Abbott) aqueous solution: 400 ml

CLAIMS:

1. A medical device having a bio-active coating on at least a portion of a surface thereof, said bio-active coating comprising a first substantially water-insoluble coating layer formed from an aqueous dispersion or emulsion of an organic acid functional group-containing polymer and a polyfunctional cross-linking agent, wherein a portion of said polyfunctional cross-linking agent is covalently bonded to said organic acid groups on said polymer and further wherein an excess of said polyfunctional cross-linking agent is not covalently bonded to said organic acid groups on said polymer, and a second coating of an aqueous solution or dispersion containing an organic acid functional group-containing bio-active agent, said first coating covalently bonded to said second coating through said excess cross-linking agent and said organic acid functional groups on said bio-active agent.

2. The medical device of claim 1, wherein said surface is selected from the group consisting of polymeric compositions, non-polymeric compositions and combinations thereof.

3. The medical device of claim 2, wherein said surface is further selected from the group of polymeric compositions consisting of olefin polymers including polyethylene, polypropylene, polyvinyl chloride, polytetrafluoroethylene, polyvinyl acetate, polystyrene, poly(ethylene terephthalate), polyurethane, polyurea, silicone rubbers, polyamides, polycarbonates, polyaldehydes, natural rubbers, polyether-ester copolymers, styrene-butadiene copolymers and combinations thereof.

4. The medical device of claim 3, wherein said surface is further selected from the group of non-polymeric compositions consisting of ceramics, metals, glasses and combinations thereof.

5. The medical device of claim 3, wherein said device is an endoprosthesis.

6. The medical device of claim 5, wherein said endoprosthesis is selected from the group consisting of grafts, stents and graft-stent devices.

7. The medical device of claim 5, wherein said endoprosthesis is selected from the group consisting of catheters, guidewires, trocars and introducer sheaths.

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L41: Entry 18 of 21 File: USPT Feb 9, 1999

DOCUMENT-IDENTIFIER: US 5869127 A
TITLE: Method of providing a substrate with a bio-active/biocompatible coating

Brief Summary Text (2):
This invention relates generally to bio-active substrate coatings. More particularly, the present invention relates to a method for providing a medical device or a part thereof with a bio-active coating which enhances the antithrombogenic nature of such a device without the use of solvents and/or the need for high temperature curing. Coatings and devices incorporating such coatings are also described.

Brief Summary Text (4):
It is generally known to provide a substrate, such as a medical device or parts of such a device with bio-active coatings for the purpose of enhancing the bio-compatibility of the device when it is introduced into a mammal, such as a human body.

Brief Summary Text (8):
International Patent Applications Nos. PCT/EP92/00918, PCT/EP92/00919 and PCT/DK92/00132 disclose methods for providing medical devices having polyurethane surfaces with a hydrophilic coating of poly(meth)acrylamide. Before application of the hydrophilic coating to the poly(meth)acrylamide substrate surface, it is treated with a compound having functional groups capable of reacting with the polyurethane and the poly(meth)acrylamide, respectively. This compound is typically a di- or higher isocyanate functionality in an organic solvent.

Brief Summary Text (11):
For example, EP Patent Application Nos. 92100787.8 and EP 0 496 305 A2 disclose methods for preparing a shaped medical article with a lubricous coating. In these methods, a coating composition that includes a blend of polyurethane and polyvinylpyrrolidone is co-extruded with a substrate polymer to produce a shaped article having on a surface thereof a layer of the coating composition which becomes lubricous when contacted with water.

Brief Summary Text (16):
Thus, heat-sensitive substrates, such as poly(ethylene terephthalate) (PET) balloon catheters cannot be used with this material. Moreover, molecules such as nucleic acids, proteins, peptides, hormones, heparin and the like are heat-sensitive biomolecules which cannot be exposed to such high temperatures without losing their activity.

Brief Summary Text (17):
The art is not limited, however, to medical devices having lubricious coatings disposed on a surface thereof. Rather, medical articles or devices coated with bio-compatible or bio-active agents have also been described, some of which are set forth below. All of these patents employ various inefficient and/or harsh methods for attaching the bio-compatible/bio-active agent to the surface of a medical article.

Brief Summary Text (18):
For example, U.S. Pat. No. 5,541,167 describes a thrombo-resistant and defoaming coating for blood contacting surfaces including bubble oxygenators, blood filters, etc. This coating includes a commercial preparation of polydimethylsiloxane and silicon dioxide and a quartemary ammonium complex of heparin, such as stearyldimethylbenzyl. This coating, however, suffers from the drawback that the defoaming and heparin components are dissolved in an organic solvent, such as methylene chloride. Such solvents can denature and reduce the bio-activity of bio-active agent, such as heparin. Furthermore, such organic solvent systems produce

environmentally hazardous waste, as well as attacking certain polymer substrates.

Brief Summary Text (19):
In a different approach to rendering an implantable medical device bio-compatible, U.S. Pat. No. 5,360,397 describes a porous bio-compatible and bio-stable polyurethane mesh for a catheter made from polycarbonate urethane. This mesh is sputter coated and/or impregnated with a bio-active agent, such as for example, a bactericide. A catheter treated in such a manner, however, is imparted with transient bio-activity at best because the bio-active agent is not covalently bound to the surface thereof. Furthermore, the process of making such a catheter is inefficient because the porous polyurethane mesh must be attached to the surface of the catheter prior to the application of the bio-active agent.

Brief Summary Text (20):
Still further, U.S. Pat. No. 5,263,992 describes a medical device having a bio-compatible coating which includes a bio-compatible agent, such as for example, heparin or streptokinase and a chemical linking moiety. This chemical linking moiety has a structure represented by: A-X-B, wherein A is a photochemically reactive group, B is a reactive group which responds to a different stimulus than A and X is a non-interfering skeletal moiety, such as a C.sub.1 -C.sub.10 alkyl. The bio-compatible agent is covalently linked to the surface of the medical device via the linking moiety. In particular, the photochemically reactive group (A) when activated covalently binds to the surface of the medical device. The remaining unreacted reactive group (B) when activated covalently binds to the bio-compatible agent and anchors it to the surface of the medical device. Such devices, however, are difficult and inefficient to produce because they require the use of two separate stimuli to activate the A and B groups of the chemical linking moiety, respectively. Furthermore, the UV light used to activate the A group of the chemical linking moiety for covalently binding it to the surface of a medical device can denature bio-active agents. Such denaturization reduces the bio-activity of such agents and can result in undesirable medical outcomes, such as, clot formation in the case of an anti-thrombogenic agent.

Brief Summary Text (21):
The present invention, however, is directed to a method of providing a substrate, particularly a medical device, or a part of such device, intended for introduction in the human body, with a bio-active coating which enhances the bio-compatibility of the substrate. This method is particularly advantageous because it makes it possible to coat devices which are sensitive to high processing temperatures, such as (PET) balloon catheters and other polymeric or heat sensitive materials or biomolecules. Moreover, the present invention discloses the use of two-component bio-compatible coatings which are both aqueous based. Such coatings are mutually soluble and do not pose the increased medical risks associated with coatings containing organic solvents. Furthermore, preparation of the present aqueous coatings is more efficient because vacuum baking substrates is not required as there are no organic solvents that must be removed. Moreover, because the bio-active surface is covalently bonded to the polymer of the first coating, this coating is permanently attached to the substrate unlike certain of the transient coatings discussed above.

Brief Summary Text (22):
In summary, the prior art methods suffer from the drawback that they use organic solvents in their coating layer and/or cure at high temperatures, are transient or inefficient to produce. Thus, there is a need for improved bio-active agent/bio-compatible coatings which enhance the compatibility and abrasion-resistance of the surface of heat sensitive medical devices. In particular, there is a need for improved compositions and devices which have antithrombogenic properties and more efficient methods of providing same. The present invention is directed to meeting these and other needs.

Brief Summary Text (25):
In another embodiment of the present invention, there is provided a medical device having a bio-active coating on at least a portion of a surface thereof. This bio-active coating includes a first substantially water-insoluble coating layer formed from an aqueous dispersion or emulsion of an organic acid functional group-containing polymer and an excess of a polyfunctional cross-linking agent which is reactive with

the organic acid groups on the polymer. This composition also includes a second coating of an aqueous solution or dispersion of a bio-active agent or its derivative which contain an organic acid functional group or metal salt thereof. The first coating is covalently bonded to the second coating through reaction of the excess cross-linking agent and the organic acid functional groups on the bio-active coating.

Detailed Description Text (17):
Non-limiting classes of useful bio-active agents of the present invention include antithrombogenic agents, antibiotic agents, anti-tumor agents, antiviral agents, anti-angiogenic agents, angiogenic agents, anti-mitotic agents, anti-inflammatory agents, angiostatin agents, endostatin agents, cell cycle regulation agents, genetic agents, including hormones, such as estrogen, their homologues, analogs, derivatives, fragments, pharmaceutical salts and mixtures thereof. Other useful bio-active agents include for example, viral reactors and growth hormones such as Fibroblast Growth Factor and Transforming Growth Factor-.beta., their homologues, analogs, derivatives, fragments, pharmaceutical salts and mixtures thereof. One specific type of bio-active material useful in the present invention is the class of organic acid functional group-containing polysaccharides. For purposes of the present invention, such polysaccharides include linear and branched polymers of monosaccharides. The preferred polysaccharide bio-active agents of the present invention are glycosaminoglycans (hereinafter "GAGs") . Glycosaminoglycans are unbranched polysaccharide chains of repeating disaccharide units. One of the repeating disaccharide units is usually an amino sugar (N-acetylglucosamine or N-acetylgalactosamine) which can be sulfated. The second sugar of the disaccharide unit is usually a uronic acid, such as for example, glucuronic or iduronic acid. Because there are sulfate or carboxyl groups on most of their sugar residues, GAGs are highly negatively charged and are ideal for covalently bonding to the first coating layers via the excess, unreacted functional groups on the cross-linking agent. GAGs which are useful as bio-active agents in the present invention include, for example, heparin, hirudin, heparin sulfate, hyaluronic acid, chondroitin sulfate, dermatan sulfate, keratan sulfate, EPA, prostoctein, reopro, integrin, lytic agents including urokinase and streptokinase, their homologs, analogs, fragments, derivatives and pharmaceutical salts thereof. Other GAG containing molecules are also contemplated by the present invention, for example GAG-containing proteins, such as proteglycans.

Detailed Description Text (18):
Moreover, the bio-active agent of the present invention can also include organic acid functional group-containing antibiotics. For purposes of the present invention, such antibiotics include penicillins, cephalosporins, vancomycins, aminoglycosides, quinolones, polymyxins, erythromycins, tetracyclines, chloramphenicols, clindamycins, lincomycins, sulfonamides their homologs, analogs, fragments, derivatives, pharmaceutical salts and mixtures thereof.

Detailed Description Text (19):
Additionally, the bio-active agent of the present invention can also include organic acid functional group-containing anti-tumor agents. For purposes of the present invention, such anti-tumor agents include paclitaxel, docetaxel, alkylating agents including mechlorethamine, chlorambucil, cyclophosphamide, melphalan and ifosfamide; antimetabolites including methotrexate, 6-mercaptopurine, 5-fluorouracil and cytarabine; plant alkaloids including vinblastine, vincristine and etoposide; antibiotics including doxorubicin, daunomycin, bleomycin, and mitomycin; nitrosureas including carmustine and lomustine; inorganic ions including cisplatin; biological response modifiers including interferon; enzymes including asparaginase; and hormones including estrogen, tamoxifen and flutamide their homologs, analogs, fragments, derivatives, pharmaceutical salts and mixtures thereof.

Detailed Description Text (21):
In certain cases, such bio-active agents may also become lubricous upon contact with an aqueous medium. Such lubricity will depend on a number of factors, including the type of bio-active agent, its molecular weight, the exposure level to the aqueous medium, as well as the presence of agents which facilitate wetting. In the present invention, the molecular weight of the bio-active agent can vary from fewer than 500 for paclitaxel to about 3,000 to about 30,000 for heparin to an excess of 8,000,000 for hyaluronic acid.

Detailed Description Text (23):
In one embodiment of the present invention, the functional groups of the cross-linking agent react with the organic acid functional groups of the polymer in the first coating and the organic acid functional groups of the bio-active agent at a temperature below 120.degree. C. Preferably, these reactions take place between about 10.degree. C. to about 70.degree. C. The drying step for the second coating is chosen based on the substrate and the compositions used in the first and second coatings. Many bio-active agents are temperature sensitive and extreme care must be taken in selecting the appropriate drying temperatures with such agents. For example, when heparin is the bio-active agent, the drying temperature should be no greater than about body temperature.

Detailed Description Text (29):
As set forth above, non-polymeric substrates may also be used in the present invention. These non-polymeric substrates include, for example ceramics, metals, glasses and the like. Furthermore, the substrates of the present invention may include a combination of one or more polymers and/or one or more non-polymers. Examples of metals employed in medical devices include, without limitation, stainless steel, superelastic materials (shape-memory) such as nitinol, gold, silver, titanium, tantulum, platinum and alloys thereof.

Detailed Description Text (30):
In another embodiment of the present invention, a medical device having a bio-active coating on at least a portion of a surface thereof is provided for use in conjunction with a body. The bio-active coating includes a first substantially water-insoluble coating layer formed from an aqueous dispersion or emulsion of an organic functional group-containing polymer and an excess of a polyfunctional cross-liking agent, each of which is described above. As set forth previously, the cross-linking agent is reactive with the organic acid groups of the polymer.

Detailed Description Text (43):
1.2% aqueous solution of Sodium Heparin (Abbott): 400 ml

Detailed Description Text (44):
The above solution is prepared by adding an appropriate amount of heparin powder to water under agitation for several hours to obtain a clear homogeneous solution.

Detailed Description Text (45):
A substrate is prepared by extruding a blend of two grades of polyether-ester block copolymer ARNITEL EM 740 and EM630 (from Akzo) with BaSO.sub.4, into a tube. The tube is dipped into the first coating composition prepared above and dried at ambient temperature (room temperature) for 40 minutes. Then the tube is dipped in the second coating composition and dried at ambient temperature over night to form a continuous coating of the heparin on the surface of the substrate. The coated surface shows very good antithrombogenic effect when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity. The coating is strongly retained on the surface even under the application of strong forces.

Detailed Description Text (53):
1.2% sodium heparin (Abbott) aqueous solution

Detailed Description Text (57):
First and second coating compositions are prepared as described in Example 2, with the exception that heparin sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (59):
First and second coating compositions are prepared as described in Example 2 except that sodium hyaluronate (hyaluronic acid) is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining

its bio-activity.

Detailed Description Text (61):
First and second coating compositions are prepared as described in Example 2 except that chondroitin sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (63):
First and second coating compositions are prepared as described in Example 2 except that dermatan sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (65):
First and second coating compositions are prepared as described in Example 2 except that keratan sulfate is substituted for heparin in the second coating. Endoprostheses are coated as described in Example 2. The coated endoprostheses show excellent anti-thrombogenic activity and lubricity when contacted with blood. Furthermore, the coating has very good durability while still retaining its bio-activity.

Detailed Description Text (75):
Heparin: 400 ml of Sodium Heparin (Abbott) in 1% Versicol WN23

Detailed Description Text (86):
1.0% aqueous solution of Sodium Heparin (Abbot): 400 ml

Detailed Description Text (97):
0.8% sodium heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (108):
1% Sodium Heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (119):
1% sodium heparin (Abbott) aqueous solution: 400 ml

Detailed Description Text (129):
1% sodium heparin (Abbott) aqueous solution: 400 ml

CLAIMS:

9. The method according to claim 1, wherein said bio-active agent is selected from the group consisting of anti-thrombogenic agents, antibiotic agents, anti-tumor agents, antiviral agents, anti-angiogenic agents, angiogenic agents, anti-mitotic agents, anti-inflammatory agents, angiostatin agents, endostatin agents, cell cycle regulatory agents, genetic agents, growth hormones and mixtures thereof.

12. The method according to claim 11, wherein said glycosaminoglycan is selected from the group consisting of heparin, hirudin, heparin sulfate, hyaluronic acid, chondroitin sulfate, dermatan sulfate, keratin sulfate, prostoctein, reopro, integrin and chemically-modified equivalents thereof.